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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/524,140	03/10/2000	Qiming Chen	10991147-1	5742

22879 7590 03/26/2003

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EXAMINER
SHAFFER, ERIC T

ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 03/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/524,140	CHEN ET AL.	
	Examiner	Art Unit	
	Eric T. Shaffer	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 March 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This communication is in response to the amendments filed December 26, 2002.

Summary Of Instant Office Action

2. Applicant's arguments, filed December 26, 2002, concerning claims 1 – 25 mailed on August 29, 2002 have been considered, deemed unpersuasive and are maintained.

3. None of the claims 1 - 25 have been cancelled or amended. No new claims have been added.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1 - 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Megiddo et al. (US 6,182,070).

6. **Claim 1** recites a method of generating association rules, which is taught by Megiddo et al., which recites "a method for determining one or more association rules having a predetermined relationship to a dataset" (column 12, lines 37 – 38) and "the steps of generating a

predictive association rule which indicates how much variance in a support value and a confidence value is expected" (column 12, lines 58 – 59).

The method comprising:

a) receiving a volume cube, with dimensions product, customer, merchant, time and area, that represents the purchase volume of customers; This is taught by Megiddo et al., which recites using "Number of Frequent Items", which is a count of each individual product, "Number of Customers", which is a count of each individual customer, the choice of "SuperMarket", "Dept. Store" or "Mail Order" for merchant, and the "Number of Transactions" as purchase volume (column 11, table 1).

b) generating an association cube, a population cube and a base cube based on the association cube, population cube, and the base cube. Generating a new cube or cubes from an existing cube or cubes is taught by Megiddo et al., which recites "generating one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions" (column 12, lines 43 – 45).

The association cube, with dimensions product, product2, customer group, merchant, time, area, is taught by Megiddo et al., which recites comparing two product as "if they know that, given a consumer's purchase of a first set of items (a first itemset), the same consumer can be expected, with some degree of probability, to purchase a particular second set of items (a second set)" (column 1, lines 18 –21), "Number of Customers", which is a count of each individual customer or a group of customers, the choice of "SuperMarket", "Dept. Store" or "Mail Order" for merchant, and the "Number of Transactions" as purchase volume (column 11, table 1).

The population cube, with dimensions product, customer group, merchant, time, area, is taught by Megiddo et al., which recites "Number of Frequent Items" as product, "Number of Customers" as customer group, and merchant as the choice of "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

The base cube, with dimensions customer group, merchant, time, area, is also taught by Megiddo et al., which recites "Number of Customers" for customer group, and merchant as the choice of "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

c) deriving a confidence cube and a support cube of an association rule based on the association cube, population cube and the base cube.

The confidence cube, of dimensions product, product2, customer group, merchant, time, area, and the support cube, of dimensions product, product2, time, time2, group and merchant are taught by Megiddo et al., which recites more than one product as "Items per Transaction", customer group as "Number of Customers" and merchant as a choice of "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

The Megiddo et al patent does not specifically recite the use of time and area as fields in a data cube or table. It is notoriously well known in the art of computer software development at the time of the invention was made to incorporate dimensions that encompasses time into the cube data tables because sales for many products are seasonal, with sales increasing or decreasing based on season of year, month, or proximity to Christmas or other holidays. Sales of products may also vary with time of month or day of the week.

It also is well known to incorporate area or region because the sales volume of many products varies according to which area of the country said product is marketed in. Some

products sell better in the south, while others sell better in the north or on the west coast. Similarly, some products sell greater volumes in the city, while others sell more in the country.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include time and area as dimensions in the synthetic database tables is to improve the accuracy of the statistics-based association rules generation method and system. Incorporating time and area as fields or dimensions will increase the granularity of the data analysis, provide more possible explanations to seemingly significant but coincidental correlations in the data relationships, and decrease the number of rules that are assumed to be true but that are, under closer scrutiny, in fact false, which is known as Type II error. This would have the advantage of prevent marketing and promotional resources from being wasted on projects that were assumed to be true but are in fact false.

7. **Claim 2** recites the claim 1 method where generating an association cube, a population cube and a base cube based on the volume cube including the step of generating an association cube that has at least two levels and at least two dimensions. This is taught by Megiddo et al., which recites at least two levels in disclosing the three merchant levels of "SuperMarket", "Dept. Store" and "Mail Order" (column 11, table 1). The two dimensions of the association cube is recited by the three types of merchant and the product recited as number of frequent items.

8. **Claim 3** recites the claim 1 method where the step of generating an association cube, a population cube and a base cube based on volume includes the step of generating a scoped association rule; wherein the step of deriving a confidence cube and a support cube of an

association rule based on the association cube, population cube, and the base cube includes the step of deriving a confidence cube and a support cube of a scoped association rule based on the association cube, population cube, and the base cube. The scoped association rule is taught by Megiddo et al, which recites "discovering purchasing tendencies of consumer side identifying association rules between itemsets of transactions within a database" (column 14, lines 43 - 44).

9. **Claim 4** recites the claim 1 method with the step of generating an association cube, a population cube and a base cube based on volume includes the step of generating an association rule with conjoint items cube; wherein the step of deriving a confidence cube and a support cube of an association rule based on the association cube, population cube, and the base cube includes the step of deriving a confidence cube and a support cube of an association rule with conjoint items based on the association cube, population cube, and the base cube. Conjoint items, or the ability to consider how buyers consider a range of options, is taught by Megiddo et al., which recites three separate options for a choice of merchant in either "SuperMarket", "Dept. Store" or "Mail Order" (column 11, table 1).

10. **Claim 5** recites the claim 1 method where the step of generating an association cube, a population cube and a base cube based on volume includes the step of generating a functional association rule-cube; wherein the step of deriving a confidence cube and a support cube of an association rule based on the association cube, population cube, and the base cube includes the step of deriving a confidence cube and a support cube of a functional association rule based on the association cube, population cube, and the base cube. The functional association of using

variables to perform calculations, which is taught by Megiddo et al., which recites "Number of Frequent Itemsets" and "Number of Frequent Items", which when multiplied together, produce the product Number of Hypotheses (column 9, lines 68 - 69).

11. **Claim 6** recites the claim 1 steps (a), (b), and (c) implemented using On Line Analytical Processing programming. This is taught by Megiddo et al., which recites on-line transactions being used to generate rules as "one or more association rules mined from a database is provided which generates one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions, each transaction including one or more items, wherein the occurrences of all items in each synthetic database are independent" (column 4, lines 56 - 61).

12. **Claim 7** recites the method of claim 1 where step (a) includes the steps of:

Receiving a first volume cube that represents the purchase volume of customers for a first region

Receiving a second volume cube that represents the purchase volume of customers for a second region; and

Where step (b) includes the step of generating an association cube, a population cube and a base cube based on the first volume cube and the second volume cube.

This is taught by Megiddo et al., which recites the volume, association, population and base cubes as discussed in the analysis of claim 1.

The Megiddo et al patent does not specifically mention the use of regions as fields in a data cube or table. It is notoriously well known to one skilled in the art of computer software

development to incorporate dimensions that encompasses regions in the cube data tables because the sales volume of many products varies according to which region of the country said product is marketed in. Some products sell better in the south, while others sell better in the north or on the west coast.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include region as a dimension in the synthetic database tables is to improve the accuracy of the statistics-based association rules generation method and system. Incorporating regions as fields or dimensions will increase the granularity of the data analysis, provide more possible explanations to seemingly significant but coincidental correlations in the data relationships, and decrease the number of rules that are assumed to be true but that are, under closer scrutiny, in fact false, which is known as Type II error. Incorporating regions would prevent marketing resources from being wasted in regions a product would not sell well in and allow said resources to be more effectively used elsewhere.

13. **Claims 8, 9 and 18** recite the system and method where each LDOS comprises a local data warehouse and at least one local OLAP server, with the local data warehouse being adapted to receive and store said transaction data. This is taught by Megiddo et al., which recites "means for generating one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions, each transaction containing one or more items" (column 13, line 52 - 55).

Wherein the local computation engine builds the local profile cubes that contains at least partial information regarding customer profiling by periodically mining new transactions flowing

into said local data warehouse and deriving patterns for local analysis, said local computation engine also being adapted to incrementally update said local profile cubes. This is taught by Megiddo et al., which recites "a method for data mining which may include the statistical significance determining process in accordance with the invention. The method starts at step 102 in which a database is processed (mined) to discover any association rules" (column 9, lines 60 – 64).

The Megiddo et al patent does not specifically mention the use of kind as a field in a profile cube. It is notoriously well known in the art of computer software development to incorporate dimensions that encompasses kind into the profile cube data tables because kind, which consists of sales volume generated by sales events, coupons and discounts is used to break out sales data and determine which part of the sales volume is being achieved by targeting customers with premium offers and which part of sales volume is being achieved by customers paying full price.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include kind as dimensions in the synthetic database tables is to improve the accuracy of the statistics-based association rules generation method and system. Incorporating kind as a field or dimensions will increase the granularity of the data analysis, and allow rules to be generated go beyond merely knowing that, in general, a promotion is effective. Using kind will empower the user to actually identify which specific promotional item or event is the most and least effective at increasing sales volume. This will have the benefit of saving money by avoiding sponsoring ineffective sales events and more appropriately channeling these funds into the most cost effective sales events.

14. **Claims 10 and 19** recite the claim 9 system and the claim 18 method where a local data warehouse receives and stores transaction data in a first predetermined interval and wherein said local OLAP engine generates said local profile cubes in a second predetermined interval. This is taught by Megiddo et al., which recites "after executing the steps described below, the identifier kernel outputs protective rules" (column 5, lines 37 - 39). In the Megiddo device, the interval is defined as the time it takes to execute a specific number of steps.

15. **Claims 11 and 20** recite the claim 9 system and the claim 18 method where GDOS comprises a global data warehouse and at least one global OLAP server,

The global data warehouse for receiving and storing the local profile cubes. This is taught by Megiddo et al., which recites "means for generating one or more synthetic databases from the dataset, each database containing a plurality of transactions" (column 14, lines 23 - 25).

The global computation engine for combining summary information from each of said LDOS to build and incrementally update said global profile cubes and association rules, and for providing feedback to said plurality of LDOS. This is also taught by Megiddo et al., which recites "means for generating one or more synthetic databases from the dataset" (column 14, lines 23 - 24).

16. **Claims 12 and 21** recite the claim 11 system and the claim 20 method where said local and global profile cubes comprise information of a plurality of customers, said information being derived from transaction data with said customers as stored by said local and global data

warehouses, said profiling information specifying at least the following: kind, product, customer, merchant, time and area. This is taught by Megiddo et al., which recites "a computer-based system for discovering purchasing tendencies of consumers by identifying association rules between itemsets of transactions is provided in which the computer-based system discovers association rules in a dataset and generates one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions wherein the occurrences of all items are independent" (column 5, lines 5 - 20).

17. **Claims 13 and 22** recite the claim 12 system and the claim 21 method where said local profile cubes are maintained at LDOS and said global profile cubes are maintained at GDOS, each of said local profile cubes being populated by mapping values in transaction data records into each dimension of said profile cube, each of said global profile cubes being retrieved and updated by merging appropriate local profile cubes. This is taught by Megiddo et al., which recites "all of the combinations of items are found which have a transaction support above the minimum user-defined support and these combinations of items are called frequent itemsets. Next, the frequent itemsets are used to generate desired association rules" (column 2, lines 47 - 52).

18. **Claims 14 and 23** recite the claim 12 system and the claim 21 method where said profile cubes are used to derive a plurality of shopping pattern cubes, said shopping pattern cubes comprising;

Shopping behavior of at least one customer. This is taught by Megiddo et al., which recites the ability to break out data by "Number of Customers" (column 11, table 1).

Shopping patterns based on probability distribution; This is taught by Megiddo et al., which recites "means for ranking the identified association rules based on the determined likelihood in order to identify association rules which have a predetermined relationship to the dataset" (column 13, lines 64 - 66) and "The p-value of a test result is the probability of obtaining an outcome as least as extreme as the outcome actually observed assuming that the null hypothesis is true" (column 7, lines 33 - 35).

Shopping patterns based on volume; This is taught by Megiddo et al., which recites determining patterns based on "Number of Transactions" and "Number of Frequent Items" (column 12, table 1).

19. **Claims 15 and 24** recite the claim 8 system and the claim 17 method where association rules comprise scoped association rules with different bases, each of the bases being said scoped association rule's population over which said scoped association rules is defined; This is taught by Megiddo et al., which recites " computer usable code means also discovers a plurality of association rules by analyzing the transactions having a similar probability threshold value for each synthetic database" (column 4, lines 25 – 28).

Multidimentional association rules with "customer" being its base, "products" being its item, and "merchant", "area" and "time" being underlying features of said multidimentional association rules; This is taught by Megiddo et al., which recites "Number of Frequent Items", and "SuperMarket", "Dept. Store" and "Mail Order" as merchants (column 11, table 1).

Multilevel association rules with its features being represented at multiple levels. This is taught by Megiddo et al., which recites "the database comprises one or more transactions, wherein each transaction contains one or more items" (column 3, lines 65 - 67).

The Megiddo et al patent does not specifically recite the use of "area" and "time" as fields being underlying features of said multidimentional association rules. However, it is notoriously well known in the art of computer software development to incorporate dimensions that encompasses time into the cube data tables because sales for many products are seasonal, with sales increasing or decreasing based on season of year, month, or proximity to Christmas or other holidays. Sales of products may also vary with time of month or day of the week.

It also is well known to incorporate area or region because the sales volume of many products varies according to which area of the country said product is marketed in. Some products sell better in the south, while others sell better in the north or on the west coast. Similarly, some products sell greater volumes in the city, while others sell more in the country.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include time and area as dimensions in the synthetic database tables is to improve the accuracy of the statistics-based association rules generation method and system. Incorporating time and area as fields or dimensions will increase the granularity of the data analysis, provide more possible explanations to seemingly significant but coincidental correlations in the data relationships, and decrease the number of rules that are assumed to be true but that are, under closer scrutiny, in fact false, which is known as Type II error. This would have the advantage of prevent marketing and promotional resources from being wasted on projects that were assumed to be true but are in fact false.

20. **Claims 16 and 25** recite the claim 15 system and the claim 24 method where association rules are mined by:

Converting a volume cube into an association cube, a base cube and a population cube, said volume cube representing purchase volumes of customers dimensioned by item, base and feature; The purchase volumes are taught by Megiddo et al., which recites "Number of Transactions" (column 11, table 1).

Deriving a support cube based on said base cube and said association cube; and

Deriving a confidence cube based on said base cube and said association cube;

This is taught by Megiddo et al., which recites "generating one or more synthetic databases from the dataset, each dataset containing a plurality of transactions, the occurrence of all items in each synthetic database being independent"(column 12, lines 43 - 45).

A support cube, with dimensions customer, product, group, merchant, time, time2 and area, is taught by Megiddo et al., which recites "Number of Customers" for customer, "Number of Frequent Items" for product, "Number of Frequent Itemsets" for group, and "SuperMarket, Department Store and Mail Order" for merchant (column 11, table 1).

Response to Arguments

21. Applicant's arguments filed December 29, 2000 have been fully considered, but the same are not persuasive.

a) The applicant's invention provides continuous, real-time information whereas Megiddo et al uses historical data. However, Megiddo et al does in fact teach using real-time data by

reciting "the bar-code reader may almost instantaneously read so called basket data" (column 1, lines 59 - 60).

b) The applicant's invention provides a device that processes very large amounts of data, whereas the Megiddo et al art does not process very large amounts of data. However, Megiddo et al does in fact teach using very large data sets that use millions of records by reciting "Number of Transactions 1.5 million, 570,000, 3 million" (column 11, line 6).

c) The applicant argues that Megiddo et al fails to teach the claim 1 step of generating an association cube, a population cube and a base cube. However, Megiddo et al does in fact teach a method of generating synthetic databases, or databases that are derived from other databases, which is essentially what the cubes consists of at their core, by reciting a device that "generates one or more synthetic databases front the dataset, each synthetic database containing a plurality of transactions and each transaction containing one or more items wherein the occurrences of all items in each synthetic database are independent" (column 3, lines 45 - 49).

d) The applicant argues that Megiddo et al fails to teach the claim 8 element of having a computational engine for mining and summarizing transaction data. However, Megiddo et al does in fact teach a computational means that performs data mining by reciting "given a set of transactions, the computational task of mining association rules is to generate all association rules" (column 2, lines 41 - 43).

e) The applicant argues Megiddo et al fails to teach the claims 9, 10 and 11 element of a data warehouse that stores transaction data. However, Megiddo et al does in fact teach a data warehouse or database of transaction data by reciting "a database mining system for determining the statistical significance of one or more association rules mined from a database is provided

which generates one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions, each transaction including one or more items" (column 4, lines 54 - 61).

f) The applicant argues Megiddo et al fails to teach the claim 17 step of mining and summarizing local and global transaction data. However, Megiddo et al does in fact teach a method of data mining and of summarizing data by reciting "by summing this over all of the passes, we get Number of Hypotheses<=(Number of Frequent Itemsets times Number of Frequent Items). Now, the overall method of data mining will be described." (column 9, lines 56 - 59).

Conclusion

22. Applicant's amendment necessitates the new ground(s) of rejection presented in this Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEM 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of final action.

23. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric Shaffer whose telephone number is (703) 305-5283. The Examiner can normally be reached on Monday-Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on (703) 305-9643. The fax number for the organization is (703) 305-0040/308-6306

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Receptionist whose telephone number is (703) 305-3900.

Eric Shaffer

March 10, 2003

TARIQ R. HAFIZ
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